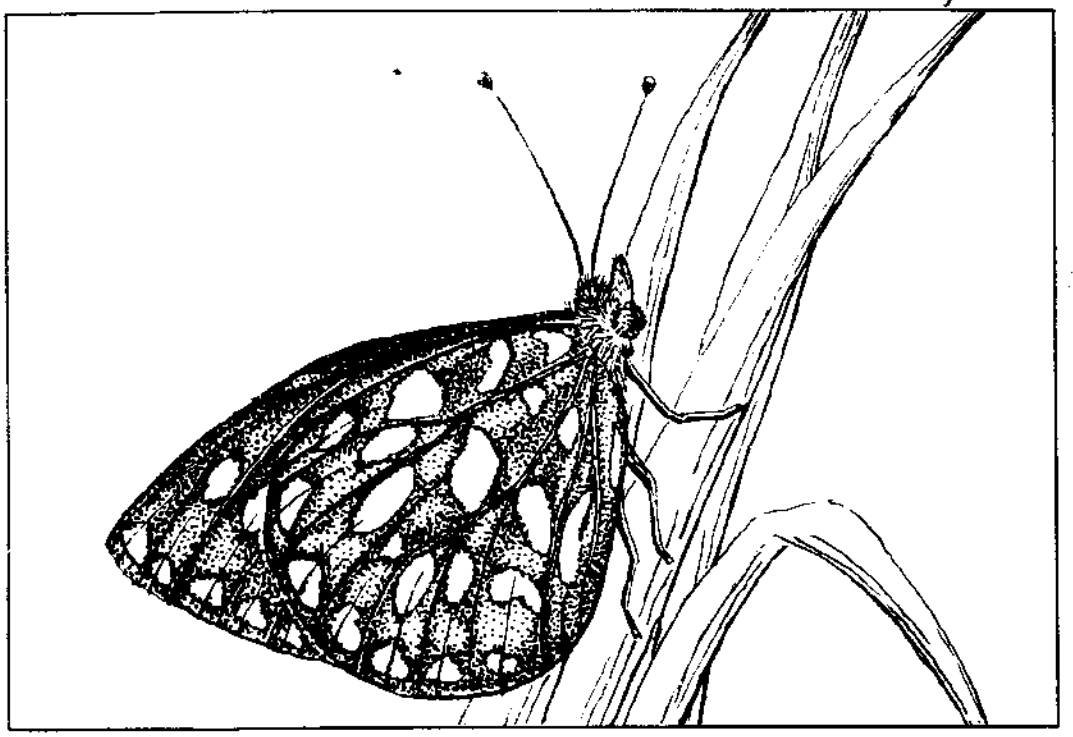
DEPARTMENT OF WILDLIFE

Washington

July 1993



STATUS OF THE OREGON SILVERSPOT BUTTERFLY *(Speyeria zerene hippolyta)* IN WASHINGTON

Washington
Department of Wildlife
Wildlife Management Division

The Washington Department of Wildlife maintains a list of endangered, threatened and sensitive species (Washington Administrative Codes 232-12-014 and 232-12-011, Appendix B). Species are evaluated for listing using a set of procedures developed by a group of citizens, interest groups, and state and federal agencies (Washington Administrative Code 232-12-297, Appendix B). The procedures were adopted by the Washington Wildlife Commission in 1990. They specify how species listing will be initiated, criteria for listing and delisting, public review, and recovery and management of listed species.

The first step in the process is to develop a preliminary species status report. The report includes a review of information relevant to the species' status in Washington including, but not limited to: historic, current, and future species population trends, natural history including ecological relationships, historic and current habitat trends, population demographics and their relationship to long term sustainability, and historic and current species management activities.

The procedures then provide for a 90-day public review opportunity for interested parties to submit new scientific data relevant to the status report and classification recommendation. During the 90-day review period, the Department holds one public meeting in each of its administrative regions. At the close of the review of the draft report, the Department completes a final status report and listing recommendation for presentation to the Washington Wildlife Commission. The final report, listing recommendation, and any State Environmental Policy Act findings are then released for public review 30 days prior to the Commission presentation.

This report is the Department of Wildlife's final Status Report and listing recommendation for the Oregon silverspot butterfly. The listing proposal will be presented to the Washington Wildlife Commission on August 14, 1993 at the Colville Community Center, Colville, Washington. Comments on the report and recommendation may be sent to: Endangered Species Program Manager, Washington Department of Wildlife, 600 Capitol Way N, Olympia, WA 98501-1091; or presented to the Wildlife Commission at its August 14 meeting.

This report should be cited as:

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in Washington

July 1993

Washington Department of Wildlife
600 Capitol Way N
Olympia, WA 98501-1091

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ACKNOWLEDGMENTS

This report was prepared by Harriet Allen, Manager, Endangered Species Program, Wildlife Management Division, Washington Department of Wildlife. Review and editing of earlier drafts by Elizabeth Rodrick and Scott Richardson improved the report. The cover illustration was done by Siobhan Sullivan. The Department appreciates the interest and information provided by individuals who attended the public meetings or wrote letters concerning the status report and listing proposal.

EXECUTIVE SUMMARY

The Oregon silverspot butterfly (*Speyeria zerene hippolyta*) is federally and state listed as a threatened species. The silverspot occurred historically from Grays Harbor County in Washington to central Oregon and a disjunct population occurred in northern California. In Washington it was found along the coast from Westport to the Columbia River. Today all but eight localities (one in California, six in Oregon, and one in Washington) have been extirpated. The Washington population is restricted to one small area on the Long Beach peninsula, where intensive searches have revealed few adult butterflies. The most recent surveys in 1991 found no butterflies. It is likely that there is no longer a viable population in Washington.

The Oregon silverspot butterfly occurs in three types of early successional grasslands with adjacent forest fringes: coastal salt spray meadows, stabilized dunes, and montane meadows. Within these grasslands, the silverspot has three primary requirements: 1) larval hostplants, 2) adult nectar sources and 3) wind protection. The larval stage of the butterfly is wholly dependent on the western blue violet (*Viola adunca*). The female lays her eggs on or near violet plants. When the larvae hatch, they find a place to overwinter until they emerge in the spring and begin feeding on the violets. The larvae pass through six instars before pupating and emerging as butterflies. Adults feed in meadows on nectar-producing herbaceous plants such as aster (*Aster spp.*), tansy ragwort (*Hypochaeris radicata*), goldenrod (*Solidago spp.*), pearly everlasting (*Anaphalis margaritacea*), false dandelion (*Hypochaeris radicata*), and thistle (*Cirsium spp.*), and seek refuge in adjacent forest fringes for protection from strong coastal winds.

Habitat destruction is the cause of the decline of the Oregon silverspot in Washington, as elsewhere. Seaside meadow sites have been developed for residential and business establishments, public parkland development, and parking areas or lawns. Excessive use of salt-spray meadows by grazing animals and off-road vehicles has destroyed habitat. Fire suppression, herbicide/pesticide applications, and the introduction of non-native plants have also contributed to the decline of this butterfly. The Department of Wildlife has been conducting management and recovery efforts aimed at acquiring and restoring suitable habitat since 1990. It is expected that in order to recover this species it will be necessary to reintroduce butterflies to restored habitat. These techniques have been developed in Oregon and have proven successful.

The Oregon silverspot butterfly population in Washington has declined to the point where it may no longer be viable.

It is recommended that the Oregon silverspot butterfly be reclassified from threatened to endangered status.

TAXONOMY

The Oregon silverspot butterfly, *Speyeria zerene hippolyta* (Edwards), is a member of the order Lepidoptera and the family Nymphalidae. It is one of 15 subspecies of *Speyeria zerene* (Boisduval). Lepidopterists have placed the 15 subspecies into five major groups (McCorkle et al. 1980). The Oregon silverspot belongs to the *bremnerii* group, which consists of four subspecies distributed in the wet coastal regions of the Pacific Northwest.

DESCRIPTION

The Oregon silverspot is a medium-sized, orange and brown butterfly with black veins and spots on the upper wing surface, and bright metallic silver spots on the underwing surface. McCorkle et al. (1980) noted that the silverspot is typically smaller and darker than related inland subspecies of the *bremnerii* group and suggested that this may be an adaptation to the windy, foggy characteristics of their breeding habitat during their flight period. The forewing length averages about 27 mm (1 in) for males and 29 mm (1.1 in) for females (McCorkle et al. 1980).

McCorkle et al. (1980) describe the larvae and eggs as follows. The eggs are cream-colored when first laid, but darken to pinkish-tan by the second day if they are fertile. The larvae are spiny and dark, with a pair of pale lines running down the back, each of which has a row of black patches running parallel to it on the outside. The bases of the spines are a straw color. This coloration camouflages the larvae when they are taking refuge in dried grass leaves. Larval pupae are smooth, rounded, and mostly dark brown, but with paler areas on the abdomen and wingcovers.

GEOGRAPHICAL DISTRIBUTION

North America

The Oregon silverspot butterfly is found only on the Pacific Northwest coast from southern Washington to central and northern Oregon, where it inhabits coastal salt spray meadows and adjacent forests. It was distributed historically along the coasts of Washington and Oregon from Westport in Grays Harbor County south to about 24 km (15 mi) north of Florence, Oregon with a disjunct population in Del Norte County, in northern California. There were 17 historic population localities documented in 1980 (McCorkle et al. 1980). Since that time three additional localities have been identified, one in Oregon and two in California (Fig. 1).

Today there are only eight of these areas where butterflies are thought to still exist: one in Washington (Loomis Lake), six in Oregon (Cullaby Lake, Gearhart, Mt. Hebo,

Cascade Head, Bray Point, and Rock Creek) and one in California (Lake Earl)(Fig. 1). Four of these, are considered viable (Mt. Hebo, Cascade Head, Bray Point, and Rock Creek). Two, (Cullaby Lake and Gearhart) are considered weak and declining; one (Loomis Lake) may be extirpated; and one (Lake Earl) is of unknown status due to limited information.

Washington

In Washington, the Oregon silverspot was found along the coast from Westport in Grays Harbor County to the Columbia River in Pacific County. It occurred in coastal dune habitat in association with meadows containing the western blue violet (*Viola adunca*). There are three known historical locations for the Oregon silverspot in Washington (McCorkle et al. 1980): Westport (1950), Loomis Lake (1975), and Nahcotta (1938) (Fig.1).

Today, the only location where the silverspot has been found in the last decade is at Loomis Lake on the Long Beach Peninsula (Fig. 1). It is likely that the silverspot has been functionally extirpated from Washington, and that no viable population remains.

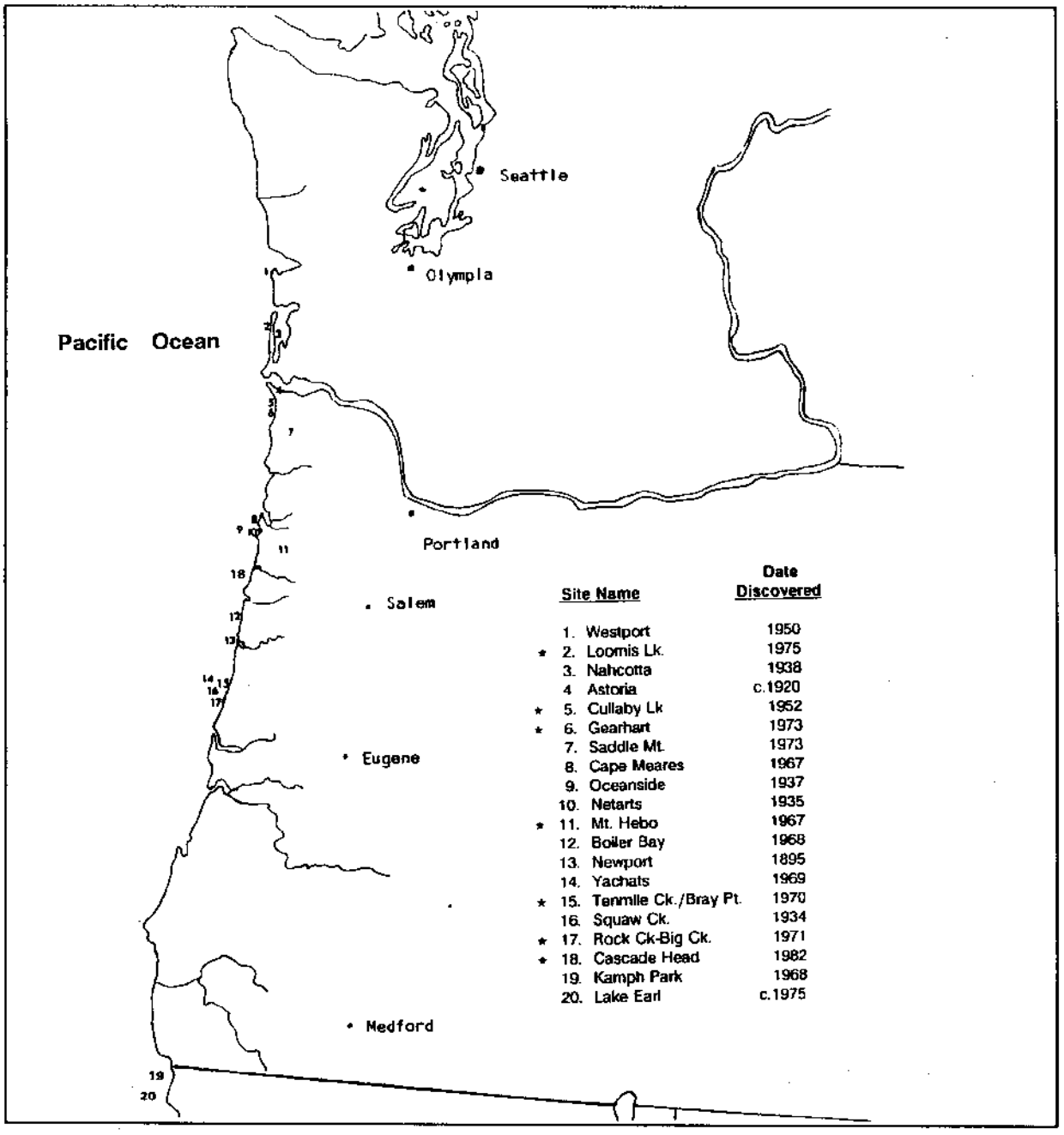

Figure 1. Historical and current (*) distribution of the Oregon silverspot butterfly (modified from McCorkle et al. 1980). Localities 1-17 from McCorkle et al. 1980; localities 18-20 identified recently.

NATURAL HISTORY

The Oregon silverspot butterfly's life history revolves around its' dependency during the larval stage on the western blue violet (Hammond et al. 1980). The butterflies mate in late summer after which the female lays her eggs near violet plants. The Oregon silverspot butterfly spends most of its life cycle in the larval stage, but very little is known about the egg, larval or pupal life stages (Pickering et al. 1992). The larvae hatch after approximately 16 to 26 days (McCorkle et al. 1980, Pickering et al. 1992) and then find a place to overwinter. When they emerge in the spring, the larvae begin to feed on the violets. The larvae are very secretive and when disturbed, usually curl up and remain motionless or quickly crawl out of sight (Pickering et al. 1992). The larvae pass through six instars (developmental stages) before pupation and emergence as butterflies. They emerge between July and September, depending on the weather. The timing of larval development coordinates the adult flight season with the best coastal weather conditions in late summer. As adults, they move to meadow edges where they mate, lay eggs, and die, thus completing their year-long life cycle.

Behavioral Characteristics

Arnold (1988) observed and described the behavioral repertoire of the adult Oregon silverspot butterfly consisting of eight primary and 20 secondary behavioral activities. The eight primary behaviors were: 1) perching, 2) basking, 3) foraging, 4) excretion, 5) locomotion (primarily flying), 6) oviposition, 7) interactions between individuals, and 8) mating. He further divided primary behaviors into two groups: solitary behaviors such as perching, basking, foraging, locomotion, excretion, and oviposition; and inter-individual behaviors such as interaction flights and mating.

Basking. Butterflies depend on solar radiation to elevate their body temperature to that needed for flight for foraging, mate seeking, escaping from predators, and ovipositioning activities. Butterflies thermoregulate by converting the radiant energy of sunlight into heat by basking (Arnold 1988). Douglas (1986) describes three types of basking used by butterflies: body, dorsal, and lateral. Arnold observed Oregon silverspot butterflies basking both dorsally (with the wings held open extended out from the body) and laterally (with the wings closed and held above the body, presenting only the ventral wing surfaces to the sun). He observed silverspots using dorsal basking on the ground or low vegetation and lateral basking when adults were perched on flowers or other vegetation.

Locomotion. Arnold (1988) noted that locomotion included walking, but was typically by flying. He described "patrolling" behavior by silverspot males. When engaged in this behavior, males flew "almost incessantly" just above the top of the grass and made periodic dips down closer to ground level to search for females. Females tended to have more random, less regimented flights.

Perching. This was a frequent activity between flights and occurred during daylight. Arnold (1988) suggested that it probably serves a number of purposes such as resting, cleaning, predator avoidance, etc. Roosting occurred late in the day when normal activity could not continue as a result of cool temperatures or increased winds. He observed the silverspots clinging upside-down to the underside of a leaf or branch with wings closed and folded over the body.

Foraging. In this activity the butterfly takes nectar and water through the proboscis. Nectar is obtained from flowers and water from moist ground. Arnold (1988) observed nectaring throughout the day once adults had warmed up enough to fly, but most often between 1100 to 1500 hr. He suggested that this time period may correspond to the time of maximum nectar production and flow in the favored nectar plants. Observed duration of nectaring varied from a few seconds to several minutes. Silverspots tended to visit the same species during a nectaring period rather than visiting flowers of different species.

Oviposition. McCorkle et al. (1980) described oviposition behavior of the Oregon silverspot butterfly as follows:

> The gravid females oviposit singly amongst the vegetation near the violet host plants. Even dried violet leaves provide sufficient stimulus to induce oviposition. Usually the females flutter low amongst the vegetation, working their way upwind. When violets are near, they pause to climb around in the meadow vegetation, probing with curved abdomen until a suitable oviposition site is contacted and an egg deposited. They are apparently sufficiently stimulated to oviposit by some "volatile" compound emanating from the violets, even at a distance of several inches. They seem to favor sites that have good sun exposure, usually avoiding north slopes of the steeper meadow rises.

Interactive Flights. These flights involved two or more adult silverspots or at least one silverspot and another butterfly or insect (Arnold 1988:13-14). Arnold stated, "males often made *investigative flights* in pursuit of other butterflies or insects that crossed their paths while patrolling or which flew by them while nectaring, perching, or basking." He also observed males investigating other males, which he suspected was to determine if the encountered male was a receptive female. Following this, the males would usually chase one another briefly before renewing their patrolling activities. These flights were usually parallel to the ground. He also observed what he termed *swarming flights*, perpendicular to the ground, where two or more males were vying for one female.

Mating. This activity consists of courtship and copulatory behaviors. Arnold (1988:14) described the pre-copulatory behavior as follows:

Once a male locates a receptive female, a pre-nuptial flight ensues in which both individuals ascend 20-30 meters above the ground while frantically flapping their wings. If receptive, the female rapidly descends and is closely pursued by the male. There may even be a brief zig-zag flight across the grass tops. Then both individuals alight on the ground or low vegetation. Rapid wing fluttering and nudging of the female by the male ensues during this pre-copulatory stage that lasts no more than a few minutes. Eventually the terminal segments of the male and female abdomens become joined, an activity known as *copulation*.

HABITAT REQUIREMENTS

General

There have been numerous studies of the habitat requirements and habitat management needs of the Oregon silverspot butterfly (McCorkle et al. 1980; Hammond et al. 1980; Hammond 1986, 1987, 1988a, 1988b, 1988c, 1989, 1990, 1991a, 1991b, 1991c; Hammond and McCorkle 1982, 1984, 1985a, 1985b; Arnold 1988; The Nat. Conserv. 1990; Pickering et al. 1992).

The Oregon silverspot has adapted to highly specialized grassland habitats which must provide three critical elements: 1) larval hostplants, 2) adult nectar sources, and 3) wind protection. Three types of grassland habitats are known for the populations in Washington, Oregon and California: coastal salt spray meadows (Oregon and California), stabilized dunes (Washington and Oregon), and a third montane type found for one population in Oregon at Mt. Hebo. It is characterized by colder temperatures, snow accumulations and less coastal fog and salt spray than the other two types.

Larval Host Plant

The western blue violet is the only species on which the larvae of the Oregon silverspot can successfully feed and develop. The adult females lay their eggs on or near the violet host plants. It appears that silverspots search for areas with high violet densities, but will oviposit under a wide range of violet densities (The Nat. Conserv. 1990). Studies in Oregon found that butterfly oviposition activity was greatest where violet density was high, thatch depth was low, and vegetation height was low (The Nat. Conserv. 1990, Pickering et al. 1992).

Studies at four silverspot sites found that while the butterflies laid eggs in areas with high violet concentrations, very few eggs were laid directly on violets. In continued studies at the same sites, they found that 60% of eggs observed were laid on dry plant material low in the vegetation. No eggs were laid directly on blue violets. In addition to dry plant

material, other substrates used included rock, soil, a blackberry (*Rubus* sp.) vine, and the hairy pappus attached to the seed of a false dandelion (*Hypochaeris radicata*). Several eggs were attached to hairs on the surface of plants rather than the actual leaf surface (Pickering et al. 1992).

The distribution, habitat requirements, ecology, and response to habitat manipulation of the western blue violet has been reviewed by many authors (Hammond et al. 1980; McCorkle et al. 1980; Hammond 1983, 1993; Hammond and McCorkle 1984). The flower is confined primarily to natural grasslands west of the Cascades. It requires low open grassland structure for long-term maintenance.

Successful reproduction and seed germination occurs mostly during early succession when there is disturbed, bare mineral soil or short, sparse grass cover. The violet is capable of surviving extended hot, dry periods in mid- and late-summer. The leaves and stems dry up and die, but the root stalks remain viable and the plant continues growing when good moisture conditions return. These conditions are common in the sand dune habitat on the northern Oregon and southern Washington coasts.

Violets will persist into later successional stages, but are eventually crowded and shaded out as succession advances to brushland and forest. Hammond (1986) found that the violet can persist for many years under other vegetation, and that dormant violets were capable of growing once the shrub, tree species, and grass thatch were removed. Historically, the native grasslands in which it occurred were primarily maintained by fire.

The relationship between violet density and other vegetation characteristics such as thatch depth and bracken fern (*Pteridium aquilinum*) density are not clear. Some sites exhibit a negative relationship between violet density and tall vegetation, thick thatch, and bracken fern (Hammond and McCorkle 1984, The Nat. Conserv. 1990, Pickering et al. 1992). However, additional sites with high violet densities occur where thatch depth and bracken fern density are greater than in random plots (The Nat. Conserv. 1990, Pickering et al. 1992).

Oregon researchers note that information on microhabitat characteristics important to the survival of egg and larval life stages, such as thermal and moisture conditions, may be important in explaining differences in habitat quality and silverspot butterfly densities (Pickering et al. 1992).

Adult Nectar Sources

A diversity of species to provide nectar sources throughout the silverspot flight season may be an important habitat consideration influencing the species' population dynamics. Silverspots use a variety of nectar sources, most of which are members of the Aster family. Frequently used native species include yarrow (*Achillea millefolium*), pearly

everlasting (*Anaphalis margaritacea*), Canada goldenrod (*Solidago canadensis*), dune goldenrod (*S. spathulata*), California aster (*Aster chilensis*), and *Aster subspicatus*. False dandelion and tansy ragwort (*Senecio jacobea*), two introduced species, are also frequently used. Species used less often for nectaring are thistles (*Cirsium* sp.), willow weed (*Epilobium* sp.), Himalayan blackberry (*Rubus procerus*), and evergreen blackberry (*R. laciniatus*) (McCorkle et al. 1980, Pyle 1985, Sayce 1990, The Nat. Conserv. 1990).

Studies at four Oregon butterfly sites found pronounced differences in species composition, abundance, and distribution of nectar sources among the four sites. Preferred nectaring species also differed at each site. Most nectaring was on tansy ragwort, pearly everlasting, Canada goldenrod, false dandelion, and yarrow. Butterflies at one site occasionally nectared on *Rubus discolor* and *Lotus corniculatus*, species not previously identified as Oregon silverspot nectar sources (The Nat. Conserv. 1990).

Arnold (1988) found that three of the preferred silverspot nectar plants were introduced species: tansy ragwort, thistle, and false dandelion. He also found a positive correlation between the abundance of tansy ragwort and Oregon silverspot butterfly numbers. He recommended that tansy ragwort eradication efforts in known silverspot sites be minimized until the importance of this and other introduced species to the maintenance of silverspot populations could be determined. He noted that other *Speyeria* species often preferred to nectar at flowers of introduced species rather than natives and suggested this may be due to three possible factors: the floral morphology of the introduced species facilitated nectar collection by silverspots; and/or the flowers of the introduced species were richer in sugars or amino acids or other chemical components.

Wind Protection

Forest fringes adjacent to grasslands containing blue violets are important habitat components for the butterflies (McCorkle et al. 1980; Hammond 1988, 1991; Arnold 1988). Butterflies use the forest fringes for shelter from strong ocean winds, nectaring areas when flowers are scarce in meadows, and as male mating territories (Hammond 1991). Arnold (1988) observed Oregon silverspots using forest fringe areas adjacent to meadows for shelter when strong coastal winds blew across the open meadows. During windy weather at three Oregon study sites, he found that ambient air temperatures were 1-3 °C (33-38 °F) warmer in the forest fringe areas. He observed butterflies using these areas for basking, perching, nectaring, courting, and mating during windy periods. When the weather was favorable, a greater percentage of observations of these behaviors were in the open meadows.

Breeding

Arnold (1988) described prime breeding habitat for adults as open and sheltered grassland meadows that support the silverspot's larval foodplant, the western blue violet.

He found that males actively patrol these areas in search of females. He observed the majority of successful courtships and copulating pairs in open and sheltered meadows. Butterflies used sheltered forest fringe areas for these activities when the exposed meadows were too cold or windy for butterfly activity.

Seasonal

Newly hatched larvae overwinter by spinning a thin silk mat on which they will rest until the following spring. With this protection, the diapausing larvae is capable of surviving heavy winter rains and sub-freezing temperatures (McCorkle et al. 1980). McCorkle speculated that larvae probably begin to feed by late March in most years. Microhabitat temperature was thought to be an important factor in ending diapause.

POPULATION DYNAMICS

Reproduction

Little is known of the breeding biology of silverspot butterflies. McCorkle et al. (1980) found that in a laboratory situation a captured female silverspot butterfly laid in excess of 214 eggs, with more than 60% fertile. Because it was unlikely she had oviposited prior to capture, they speculated the number of eggs might be close to her potential. Another captured female laid 385 eggs, with 98% fertile. They suggested that the high reproductive potential of the silverspot implied a basic *R*-selection strategy. A population of 100 females with an average oviposition rate of 100 eggs per female, would distribute 10,000 eggs through the breeding habitat. With a 70% fertility rate, 7,000 would be viable. McCorkle et al. (1980) speculated that this type of reproductive strategy would enable the species to withstand catastrophic stochastic events such as adverse weather patterns which could eliminate reproduction for an entire year. Hammond (1991) suggested the availability of nectar sources may have a significant impact on egg production and population dynamics of most *Speyeria* species, as had been documented with *Euhydryas* butterflies.

Mortality

There is little quantitative information on survivorship of different life stages of the Oregon silverspot butterfly, particularly the juvenile stages. In a 1991 study of four Oregon sites, The Nature Conservancy (1990) determined hatching rates at the Mount Hebo site in Oregon during 1990 and 1991. Hatching rates were higher in 1991 (78%, $n=23$) than in 1990 (60%, $n=10$); and mean days to hatch were slightly fewer in 1991 (23 days) than in 1990 (26 days).

Finding early instar larvae in the field is difficult, thereby limiting the measurability of larvae mortality. Importantly, it is "the overwintering larval stage in which factors affecting mortality are expressed over a six to seven month period of time" (The Nat. Conserv. 1990:16).

Nothing is known of the parasites and predators that may attack small larvae in the wild. McCorkle et al. (1980) suspected that predaceous ground beetles (Carabidae) and small spiders are potential predators. As the larvae pass through successive instars and increase in size, they probably become susceptible to new parasites and predators such as shrews, birds, and possibly mice (McCorkle et al. 1980).

Hammond and McCorkle (1991) found that *Speyeria* larvae were extremely vulnerable to a wide variety of diseases and pesticides, including BT (*Bacillus thuringiensis*) and organophosphates. Laboratory experiments resulted in mortality of all larvae fed violet leaves grown in areas sprayed with these pesticides. When attempting to raise larvae in a laboratory situation, they found them to be highly vulnerable to various bacterial and fungal gut infections.

Adult butterflies are subject to predation by birds (Arnold 1988) and to being killed by collisions with cars on roads and highways.

Hammond and McCorkle (1991) found that *Speyeria* larvae were extremely vulnerable to a wide variety of diseases and pesticides, including BT (*Bacillus thuringiensis*) and organophosphates. Laboratory experiments resulted in mortality of all larvae which were fed violet leaves grown in areas sprayed with these pesticides. When attempting to raise larvae in a laboratory situation, they found them to be highly vulnerable to various bacterial and fungal infections.

POPULATION STATUS

Past

Historically, the Oregon silverspot butterfly occurred from Westport to the Columbia River in coastal salt-spray meadows and open field habitats. Because of its virtual restriction to these meadows containing the western blue violet and nearby forest fringe shelter belts, and the significant loss of this habitat to human activities and natural plant community succession, the silverspot declined to a point at which it was listed as a threatened species by the U.S. Fish and Wildlife Service in 1980. It was listed as a state threatened species in Washington in 1983. A federal recovery plan was written in 1982 and at that time there were only 17 documented historical localities for the Oregon silverspot and only one population in Oregon was known to still be viable.

The silverspot was collected several times in the Ocean Park area during the 1910's by Agnes Veazie, a lepidopterist (R. Pyle, pers. comm. *in* Sayce 1990). Pyle (1976, 1985) collected the butterfly at the Loomis Lake site in August 1975 and caught and examined the silverspot again on the same site in 1985. Specimens were deposited in collections at the Burke Museum, Yale Peabody Museum, and the private collection of D. V. McCorkle (Pyle 1976 *in* Sayce 1990). Hammond also verified one butterfly at the Loomis Lake site and two butterflies at a nearby Copeland Road site in 1982 (Hammond and McCorkle 1982).

Present

The silverspot has been extirpated from almost all of its historical habitat on the Washington coast. Only one population on the Long Beach Peninsula was thought to remain, and it may now be functionally extirpated. Sayce (1990, 1991) surveyed 14 Long Beach peninsula sites, including all sites previously examined by Hammond and Pyle and a number of additional sites. Sites were surveyed 3 to 4 days per week from late July through late October during two years. She observed what was believed to be an Oregon silverspot butterfly in August 1990, but saw no silverspots in 1991. It is unlikely that a viable population still exists in the state.

Future

Without habitat restoration and active management the Oregon silverspot butterfly will be extirpated from Washington. It is likely that a reintroduction program will be needed to restore a viable population to the state.

HABITAT STATUS

Past

The Long Beach Peninsula is a series of dunes and swales from east to west. Prior to European settlement, the peninsula was characterized by either coniferous forests and meadows or freshwater in a series of sloughs, lakes and marshes (Sayce 1990). With the advent of settlement, there were two major changes to the hydrology and topography of the peninsula. The first, which occurred in the late 1800's to the 1930's, was the construction and excavation of a series of dikes, tidegates and ditches to drain and maintain a lower surface water level. The result was the draining of bogs and freshwater marshes, turning saltmarshes into pastureland, lakes into sloughs and lowering the subsurface water table on the remainder (Sayce 1990).

The second change was the building of a series of jetties at the mouth of the Columbia River in the early 1900's. The alteration to the western edge of the peninsula was

enormous. Sayce (1990) notes that "by 1990 as much as 915 m (3,000 ft) to 1220 m (4,000 ft) of dunes had accrued to the western edge."

The original early successional salt-spray meadows of the Oregon and Washington coast used by Oregon silverspot butterflies were likely maintained by periodic fires. They were probably dominated by short-growing native bunchgrasses including red fescue (*Festuca rubra*) and tufted hairgrass (*Deschampsia cespitosa*) and possible some native bentgrasses such as Pacific bentgrass (*Agrostis longiligula*) and seashore bentgrass (*Agrostis pallens)* (McCorkle et al. 1980). These species were eventually replaced by invasive, exotic species brought in by settlers when they began to use the meadows for livestock grazing. These introduced exotics eliminated a number of the native grasses and forbs of the meadows by crowding out low-growing plants such as the violet and producing deep layers of thatch that shaded out and killed all other meadow plants.

The coastal dune meadow habitat of the Washington coast was further eliminated or altered as a result of development, off-road vehicle damage, grazing, fire suppression and natural succession.

Present

The only Oregon silverspot butterfly habitat remaining in Washington is located on the Long Beach Peninsula. The butterfly habitat is located in the lower third of the peninsula between a lake, Loomis Lake, and the Pacific Ocean, and is approximately 4 km (2.5 mi) long. The area is dissected by a state highway and numerous residential roads and homes. It is the last area along the ocean in Washington to have undeveloped land of manageable size for the Oregon Silverspot butterfly (Sayce 1990).

The area was colonized by three dominant plants: slough sedge (*Carex obnupta*) on the low ground, and two grasses, European beachgrass (*Ammophila arenaria*) and American dune grass (*Elymus mollis*) on the dunes (Sayce 1990). Development history on individual parcels of land has determined the succession patterns. Shore pine (*Pinus contorta contorta)* is the dominant plant to follow dunegrasses on undisturbed sites, followed by sitka spruce (*Picea sitchensis*) and western hemlock (*Tsuga heterophylla*). Salal (*Gaultheria shallon*) and red alder (*Alnus rubra*) can also follow the dunegrasses. Coast willow (*Salix hookeriana*) is a typical successor to slough sedge on wetter sites Many of the meadow sites are succeeding to shrub species such as salal, Nootka rose (*Rosa nutkana*), Pacific blackberry (*Rubus ursinus*), and bracken fern (Sayce 1990).

Four sites on the peninsula are being managed for Oregon silverspot butterfly habitat. Two sites, 20 ha (50 ac), are owned by the Department of Wildlife; a 2 ha (5 ac) site occurs in Loomis Lake State Park; and a fourth site is privately owned.

There are at least four additional sites in private ownership that currently have violets. They range in size from less than 0.4 ha (1 ac) to 5.7 ha (14 ac). Sayce (1990) identified five additional forested area sites that contain fringe habitat across from violet meadows. They range in size from 8 to 16 ha (20-40 ac). Many of the meadow sites are thatchy, old meadows or thickly brushed with tree seedlings. Nectar species remain well distributed, but woody shrubs and trees are transforming the meadows to coastal forests (Sayce 1991).

Future

Maintaining habitat in the future will depend on the success of current efforts to restore degraded meadows in Loomis Lake State Park and the 20 ha (50 ac) purchased by the Washington Department of Wildlife. It may be possible to slightly increase the amount of habitat by developing cooperative management programs to create and maintain meadow and fringe habitat on existing privately-owned property.

CONSERVATION STATUS

Legal Status

The Oregon silverspot butterfly is classified under the federal Endangered Species Act as a threatened species. It is classified as Protected Wildlife and a threatened species under Washington Administrative Code 232-12-011.

Management Activities

A recovery plan for the Oregon silverspot butterfly was completed by the U.S. Fish and Wildlife Service in 1982 (Stine 1982). The primary objective of the plan was "to increase the numbers of individuals, populations, and amount of suitable habitat" of the silverspot, to permit its removal from the list of Threatened and Endangered species. The plan is being updated with specific objectives and new information gained since 1982 and is expected to be completed during 1993 (D. Hwang, pers. comm.). Critical Habitat was designated for the species in one area, Lane County, Oregon, at the time of listing.

Management activities to restore Oregon silverspot meadow habitat have been tested, implemented, and monitored in Oregon since 1982. Recovery and management efforts for the butterfly have included numerous butterfly surveys and habitat inventories at the five key butterfly sites in Oregon (Hammond 1986, 1987, 1988a, 1988b, 1988c, 1989, 1991b; Hammond and McCorkle 1982, 1984, 1985b; Arnold 1988; The Nat. Conserv. 1990; Pickering et al. 1992). After 6 years of restoration efforts, butterfly habitat in Oregon is recovering (Hammond and McCorkle 1984, Hammond 1989, 1993), although not all areas have responded and butterfly populations in some areas have declined

despite management treatments (Pickering et al. 1992). Pickering et al. (1992:22) note recommendations when testing treatments:

> The relationship between habitat conditions and butterfly use as well as the effects of management on habitat condition and butterfly use should be monitored in more detail to better determine the best management scenario. Habitat monitoring should include at a minimum, important habitat characteristics such as vegetation height, violet density, nectar species abundance and tree or shrub density. Pre-treatment condition and use should be documented with follow-up monitoring every 1 to 3 years. Additionally, weather data should be collected for each of these populations to better identify the causes of population changes over time. In the short-term, management treatments at all sites should be limited to small percentages of a given site in any one year to minimize the possible short-term impacts on population numbers.

In addition to habitat restoration experiments, techniques have been developed for rearing and releasing butterflies. Initial introduction efforts have been successful (Hammond and McCorkle 1991). The experiments in Oregon indicate that habitat restoration and population augmentation is potentially a feasible recovery strategy for this species. Additional emphasis is now being focused on forest fringe habitat, interior meadows, and creating corridors for nectaring and travel to larval habitat.

These combined techniques show promise for Oregon silverspot recovery efforts in Washington. The Washington Department of Wildlife began a habitat acquisition and restoration program for the Oregon silverspot in 1990. Using the experimental treatment strategies developed in Oregon, the Department of Wildlife, in cooperation with the U.S. Fish and Wildlife Service and the Washington State Parks and Recreation Commission, initiated the first meadow mowing program in 1990 at Loomis Lake State Park. To encourage growth of the western blue violet, 2 ha (5 ac) of dune meadow habitat were mowed. The area was first mowed in the spring to remove a heavy brush layer, then in June to clear invading bracken fern, and again in late October to remove brush regrowth. Prior to treatment, the blue violet was found only at the frequently- mowed park entrance. The State Park site was again mowed in spring and fall of 1991 and 1992. Summer vegetation surveys found vigorous resprouting of shrubs, forbs, and grasses (Sayce 1991). A significant violet response is not expected until the 3rd year of treatment.

The Department acquired 20 ha (50 ac) of silverspot butterfly habitat in 1990-1992, 8 ha (20 ac) of larval dune meadow habitat and 12 ha (30ac) of forest and meadow shelter and nectar habitat. Two of the habitat treatment strategies developed in Oregon, mowing and tree cutting, have been used on the Washington sites. It has not been

feasible to use the third technique, burning, because of the proximity of residential development to the management areas (E. Rodrick, pers. comm.).

Two hectares (5 ac) of old meadow habitat on the Department's 12 ha (30 ac) Loomis Lake site was mowed in 1991 and 1992 to remove heavy shrub and grass cover and to stimulate nectar plant growth. Much of the site is forested. Future plans are to remove timber to create corridor openings for nectaring and travel to larval habitat. The 8 ha (20 ac) Copeland Road site, acquired in 1992, added a third treatment area.

Other department recovery activities for the Oregon silverspot include surveys, habitat inventories, and identification of suitable habitat for conservation easements or cooperative agreements. The department and others have conducted surveys for the Oregon silverspot butterfly (Pyle 1985; Sayce 1990, 1991).

The silverspot is a Priority Species under the WDW Priority Habitat and Species Program. This program provides locational information and management recommendations for special species and habitats to local governments and others, primarily to facilitate habitat protection and compliance with Washington's Growth Management Act. Habitat Management Recommendations have been developed for the silverspot and are provided along with the site-specific information (Appendix A).

FACTORS AFFECTING CONTINUED EXISTENCE

Adequacy of Existing Regulatory Mechanisms

The Oregon silverspot receives protection under the Endangered Species Act, but there has been no critical habitat designated for the species in Washington under the Act. There is limited capability for habitat protection through existing state regulatory mechanisms (i.e. Washington Forest Practices Act, Growth Management Act, etc.). The Department of Wildlife has an advisory role for habitat protection for the species.

Present and Threatened Habitat Loss

Maintaining populations of Oregon silverspot butterflies depends on protecting and restoring the habitat of western blue violets and protecting the forest glade habitat used by adults. In Washington, virtually all of the habitat where the butterflies and violets have been found are threatened by the presence of heavy grass thatch or woody plant invasion, which deter violet growth. These sites are also threatened by residential, commercial, and recreational development (Pyle 1985).

Other Natural and Manmade Factors

Other factors which may constitute threats to the silverspot population include roads through butterfly habitat which may contribute to highway mortality, spraying of pesticides, eradication efforts to eliminate exotic nectaring species such as tansy ragwort, and catastrophic events such as weather conditions which can eliminate an entire year's reproductive effort.

CONCLUSIONS AND RECOMMENDATION

The Oregon silverspot butterfly historically occurred along the Washington coast from Westport to the Columbia River. It was federally listed as threatened in 1980 and state listed as threatened in 1983. During the last decade, there have been a number of surveys in the state which have found few or no butterflies. There are currently no known viable silverspot populations remaining in Washington. It is recommended that the Oregon silverspot butterfly be reclassified from threatened to endangered status in Washington.

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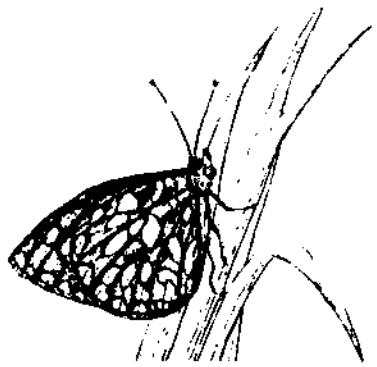
Appendix A

Washington Department of Wildlife

Management Recommendations for Oregon Silverspot Butterfly



Speyeria zerene hippolyta

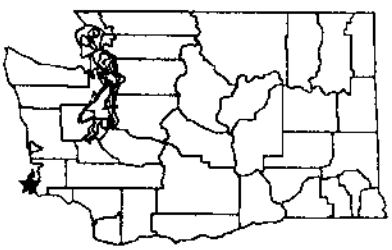
Washington Department of Wildlife

Management Recommendations for Priority Species

Oregon Silverspot Butterfly

RANGE: Historically found along the coastal zone of southern Washington and central and northern Oregon. The Oregon silverspot butterfly is classified as a federally threatened subspecies.

WASHINGTON DISTRIBUTION: Currently one small population is known from the Long Beach Peninsula (Pacific County).



HABITAT REQUIREMENTS: Oregon silverspot butterflies are found in coastal salt-spray meadows and open field habitats that support the larval host plant, western blue violet (*Viola adunca*). Moderate grass cover found in these open habitats provides shelter for the larvae from wind, rain, and sun (Stine 1982).

Adult butterflies feed in the meadows on nectar producing herbaceous plants such as aster, tansy ragwort, goldenrod, thistle, and pearly everlasting (Pyle, pers. comm.). Open areas used by the butterflies are typically surrounded by a fringe of brush or conifer trees, which provide necessary shelter for adults (Stine 1982).

In Washington, the butterflies breed in stabilized sand dune communities where violets persist. Adults presumably rest and feed in nearby open forest glades (Pyle 1985).

LIMITING FACTORS: Availability of salt-spray meadow habitat that supports the western blue violet and nearby forest fringe shelter belts.

MANAGEMENT RECOMMENDATIONS: Maintaining populations of Oregon silverspot butterflies depends upon protecting and restoring the habitat of the larval foodplant, western blue violet, and protecting the forest glade habitat used by adults. Western blue violets grow best in open, exposed areas that are free of surrounding vegetation. However, mature violets apparently can survive for long periods of time in heavily shaded areas (Hammond 1987). Butterfly habitat in Oregon is recovering after six years of habitat restoration efforts (Hammon 1989).

In Washington, virtually all of the habitat where the butterflies and violets have been found are threatened by the presence of heavy grass thatch or woody plant invasion, which deter violet growth. These sites are also

1985).

Development should not occur in areas that may support the silverspot butterfly. These areas include both the forest stands that offer shelter to adult butterflies and the dune communities where larvae feed. Shore pine succession should be reduced in meadow violet habitat, by removing young trees and other woody vegetation. Selected older hind dune areas on the Long Beach Peninsula should be mowed two or three times a year for at least three years in succession. The timing of mowing should be April and June to remove bracken fern, and November. Once violets are reestablished, mowing may only need to be done on a three year rotation, once in early spring and once in late fall. The mowing regime should also be staggered, so all habitat areas are not mowed in the same year (Hammond pers. comm.). These treatment areas should be monitored to avoid erosion.

Landowners can promote violet growth by leaving their lawns and vacant lots natural (no fertilizers or herbicides) and mowing only a few times a year (Sayce pers. comm.).

Small openings or strips, 9m-12m (30-40') wide, should be created in forest shelter areas to promote nectar plants (Hammond pers. comm.).

Camping, ORV use, and other recreational activities that damage violet habitat should be restricted in dune areas (Stine 1982).

Insecticides should not be applied in open areas or adjacent forested areas where butterflies occur (Stine 1982). Herbicides should not be applied to areas where western blue violets grow.

REFERENCES:

Oregon silverspot butterflies should not be collected in Washington.

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KEYS POINTS:

Habitat Requirements:

- Larval habitat—dune meadows with violets.
- Adult habitat—spruce-shorepine with grassy openings.

Management Recommendations:

- To restore dune meadows, mow two to three times per year for three years.
- To maintain dune meadows, mow on a three year cycle.
- Leave lawns and vacant lots natural and mow.
- Create openings or strips, 30-40 feet wide in forest shelter areas.
- Avoid insecticides, herbicides and fertilizers.

C: T10/22/90 BR

Appendix B

Washington Administrative Codes

232-12-297, 232-12-011, 232-12-014

WAC 232-12-297 Endangered, threatened, and sensitive wildlife species classification.

PURPOSE

1.1 The purpose of this rule is to identify and classify native wildlife species that have need of protection and/or management to ensure their survival as free-ranging populations in Washington and to define the process by which listing, management, recovery, and delisting of a species can be achieved. These rules are established to ensure that consistent procedures and criteria are followed when classifying wildlife as endangered, or the protected wildlife subcategories threatened or sensitive.

DEFINITIONS

For purposes of this rule, the following definitions apply:

2.1 "Classify" and all derivatives means to list or delist wildlife species to or from endangered, or to or from the protected wildlife subcategories threatened or sensitive.

2.2 "List" and all derivatives means to change the classification status of a wildlife species to endangered, threatened, or sensitive.

2.3 "Delist" and its derivatives means to change the classification of endangered, threatened, or sensitive species to a classification other than endangered, threatened, or sensitive.

2.4 "Endangered" means any wildlife species native to the state of Washington that is seriously threatened with extinction throughout all or a significant portion of its range within the state.

2.5 "Threatened" means any wildlife species native to the state of Washington that is likely to become an endangered species within the foreseeable future throughout a significant portion of its range within the state without cooperative management or removal of threats.

2.6 "Sensitive" means any wildlife species native to the state of Washington that is vulnerable or declining and is likely to become endangered or threatened in a significant portion of its range within the state without cooperative management or removal of threats.

2.7 "Species" means any group of animals classified as a species or subspecies as commonly accepted by the scientific community.

2.8 "Native" means any wildlife species naturally occurring in Washington for purposes of breeding, resting, or foraging, excluding introduced species not found historically in this state.

2.9 "Significant portion of its range" means that portion of a species' range likely to be essential to the long term survival of the population in Washington.

LISTING CRITERIA

3.1 The commission shall list a wildlife species as endangered, threatened, or sensitive solely on the basis of the biological status of the species being considered, based on the preponderance of scientific data available, except as noted in section 3.4.

3.2 If a species is listed as endangered or threatened under the federal Endangered Species Act, the agency will recommend to the commission that it be listed as endangered or threatened as specified in section 9.1. If listed, the agency will proceed with development of a recovery plan pursuant to section 11.1.

3.3 Species may be listed as endangered, threatened, or sensitive only when populations are in danger of failing, declining, or are vulnerable, due to factors including but not restricted to limited numbers, disease, predation, exploitation, or habitat loss or change, pursuant to section 7.1.

3.4 Where a species of the class Insecta, based on substantial evidence, is determined to present an unreasonable risk to public health, the commission may make the determination that the species need not be listed as endangered, threatened, or sensitive.

DELISTING CRITERIA

4.1 The commission shall delist a wildlife species from endangered, threatened, or sensitive solely on the basis of the biological status of the species being

considered, based on the preponderance of scientific data available.

4.2 A species may be delisted from endangered, threatened, or sensitive only when populations are no longer in danger of failing, declining, are no longer vulnerable, pursuant to section 3.3, or meet recovery plan goals, and when it no longer meets the definitions in sections 2.4, 2.5, or 2.6.

INITIATION OF LISTING PROCESS

5.1 Any one of the following events may initiate the listing process.

5.1.1 The agency determines that a species population may be in danger of failing, declining, or vulnerable, pursuant to section 3.3.

5.1.2 A petition is received at the agency from an interested person. The petition should be addressed to the director. It should set forth specific evidence and scientific data which shows that the species may be failing, declining, or vulnerable, pursuant to section 3.3. Within 60 days, the agency shall either deny the petition, stating the reasons, or initiate the classification process.

5.1.3 An emergency, as defined by the Administrative Procedure Act, chapter 34.05 RCW. The listing of any species previously classified under emergency rule shall be governed by the provisions of this section.

5.1.4 The commission requests the agency review a species of concern.

5.2 Upon initiation of the listing process the agency shall publish a public notice in the Washington Register, and notify those parties who have expressed their interest to the department, announcing the initiation of the classification process and calling for scientific information relevant to the species status report under consideration pursuant to section 7.1.

INITIATION OF DELISTING PROCESS

6.1 Any one of the following events may initiate the delisting process:

6.1.1 The agency determines that a species population may no longer be in danger of failing, declining, or vulnerable, pursuant to section 3.3.

6.1.2 The agency receives a petition from an interested person. The petition should be addressed to the director. It should set forth specific evidence and scientific data which shows that the species may no longer be failing, declining, or vulnerable, pursuant to section 3.3. Within 60 days, the agency shall either deny the petition, stating the reasons, or initiate the delisting process.

6.1.3 The commission requests the agency review a species of concern.

6.2 Upon initiation of the delisting process the agency shall publish a public notice in the Washington Register, and notify those parties who have expressed their interest to the department, announcing the initiation of the delisting process and calling for scientific information relevant to the species status report under consideration pursuant to section 7.1.

SPECIES STATUS REVIEW AND AGENCY RECOMMENDATIONS

7.1 Except in an emergency under 5.1.3 above, prior to making a classification recommendation to the commission, the Agency shall prepare a preliminary species status report. The report will include a review of information relevant to the species' status in Washington and address factors affecting its status, including those given under section 3.3. The status report shall be reviewed by the public and scientific community. The status report will include, but not be limited to an analysis of:

7.1.1 Historic, current, and future species population trends

7.1.2 Natural history, including ecological relationships (e.g. food habits, home range, habitat selection patterns).

7.1.3 Historic and current habitat trends.

7.1.4 Population demographics (e.g. survival and mortality rates, reproductive success) and their relationship to long term sustainability.

7.1.5 Historic and current species management activities.

7.2 Except in an emergency under 5.1.3 above, the agency shall prepare recommendations for species classification, based upon scientific data contained in the status report. Documents shall be prepared to determine the environmental consequences of adopting the recommendations pursuant to requirements of the State Environmental Policy Act (SEPA).

7.3 For the purpose of delisting, the status report will include a review of recovery plan goals.

PUBLIC REVIEW

8.1 Except in an emergency under 5.1.3 above, prior to making a recommendation to the commission, the agency shall provide an opportunity for interested parties to submit new scientific data relevant to the status report, classification recommendation, and any SEPA findings.

8.1.1 The agency shall allow at least 90 days for public comment

8.1.2 The agency will hold at least one public meeting in each of its administrative regions during the public review period.

FINAL RECOMMENDATIONS AND COMMISSION ACTION

9.1 After the close of the public comment period, the agency shall complete a final status report and classification recommendation. SEPA documents will be prepared, as necessary, for the final agency recommendation for classification. The classification recommendation will be presented to the commission for action. The final species status report, agency classification recommendation, and SEPA documents will be made available to the public at least 30 days prior to the commission meeting.

9.2 Notice of the proposed commission action will be published at least 30 days prior to the commission meeting.

PERIODIC SPECIES STATUS REVIEW

10.1 The agency shall conduct a review of each endangered, threatened, or sensitive wildlife species at least every five years after the date of its listing. This review shall include an update of the species status report to determine whether the status of the species warrants its current listing status or deserves reclassification.

10.1.1 The agency shall notify any parties who have expressed their interest to the department of the periodic status review. This notice shall occur at least one year prior to end of the five year period required by section 10.1.

10.2 The status of all delisted species shall be reviewed at least once, five years following the date of delisting.

10.3 The department shall evaluate the necessity of changing the classification of the species being reviewed. The agency shall report its findings to the commission at a commission meeting. The agency shall notify the public of its findings at least 30 days prior to presenting the findings to the commission.

10.3.1 If the agency determines that new information suggests that classification of a species should be changed from its present state, the agency shall initiate classification procedures provided for in these rules starting with section 5.1.

10.3.2 If the agency determines that conditions have not changed significantly and that the classification of the species should remain unchanged, the agency shall recommend to the commission that the species being reviewed shall retain its present classification status.

10.4 Nothing in these rules shall be construed to automatically delist a species without formal commission action.

RECOVERY AND MANAGEMENT OF LISTED SPECIES

11.1 The agency shall write a recovery plan for species listed as endangered or threatened. The agency will write a management plan for species listed as sensitive. Recovery and management plans shall address the listing criteria described in sections 3.1 and 3.3, and shall include, but are not limited to:

11.1.1 Target population objectives

11.1.2 Criteria for reclassification

11.1.3 An implementation plan for reaching population objectives which will promote cooperative management and be sensitive to landowner needs and property rights. The plan will specify resources needed from and impacts to the Department, other agencies (including federal, state, and local), tribes, landowners, and other interest groups. The plan shall consider various approaches to meeting recovery objectives including, but not limited to regulation, mitigation, acquisition, incentive, and compensation mechanisms.

11.1.4 Public education needs

11.1.5 A species monitoring plan, which requires periodic review to allow the incorporation of new information into the status report.

11.2 Preparation of recovery and management plans will be initiated by the agency within one year after the date of listing.

11.2.1 Recovery and management plans for species listed prior to 1990 or during the five years following the adoption of these rules shall be completed within 5 years after the date of listing or adoption of these rules, whichever comes later. Development of recovery plans for endangered species will receive higher priority than threatened or sensitive species.

11.2.2 Recovery and management plans for species listed after five years following the adoption of these rules shall be completed within three years after the date of listing.

11.2.3 The agency will publish a notice in the Washington Register and notify any parties who have expressed interest to the department interested parties of the initiation of recovery plan development.

11.2.4 If the deadlines defined in sections 11.2.1 and 11.2.2 are not met the department shall notify the public and report the reasons for missing the deadline and the strategy for completing the plan at a

commission meeting. The intent of this section is to recognize current department personnel resources are limiting and that development of recovery plans for some of the species may require significant involvement by interests outside of the department, and therefore take longer to complete.

11.3 The agency shall provide an opportunity for interested public to comment on the recovery plan and any SEPA documents.

CLASSIFICATION PROCEDURES REVIEW

12.1 The agency and an ad hoc public group with members representing a broad spectrum of interests, shall meet as needed to accomplish the following:

12.1.1 Monitor the progress of the development of recovery and management plans and status reviews, highlight problems, and make recommendations to the department and other interested parties to improve the effectiveness of these processes.

12.1.2 Review these classification procedures six years after the adoption of these rules and report its findings to the commission.

AUTHORITY

13.1 The commission has the authority to classify wildlife as endangered under RCW 77.12.020. Species classified as endangered are listed under WAC 232-12-014, as amended.

13.2 Threatened and sensitive species shall be classified as subcategories of protected wildlife. The commission has the authority to classify wildlife as protected under RCW 77.12.020. Species classified as protected are listed under WAC 232-12-011, as amended.

[Statutory Authority: RCW 77.12.020. 90-11-066 (Order 442), § 232-12-297, filed 5/15/90, effective 6/15/90.]

WAC 232-12-011 Wildlife classified as protected shall not be hunted or fished. Protected wildlife are designated into three subcategories: Threatened, sensitive, and other.

(1) Threatened species are any wildlife species native to the state of Washington that are likely to become endangered within the foreseeable future throughout a significant portion of their range within the state without cooperative management or removal of threats.

Protected wildlife designated as threatened include ferruginous hawk, *Buteoregalis*; bald eagle, *Haliaeetus leucocephalus*; western pond turtle, *Clemmys marmorata*; green sea turtle, *Cheloniia mydas*; loggerhead sea turtle, *Caretta caretta*; Oregon silverspot butterfly, *Speyeria zerene hippolyta*; pygmy rabbit, *Brachylagus idahoensis*.

(2) Sensitive species are any wildlife species native to the state of Washington that are vulnerable or declining and are likely to become endangered or threatened in a significant portion of their range within the state without cooperative management or removal of threats.

(3) Other protected wildlife.

Other protected wildlife include all birds not classified as game birds, predatory birds, or endangered species[,] or designated as threatened species or sensitive species; and fur seal, *Callorhinus ursinus*; fisher, *Martes pennanti*; wolverine, *Gulo luscus*; western gray squirrel, *Sciurus griseus*; Douglas squirrel, *Tamiasciurus douglasii*; red squirrel, *Tamiasciurus hudsonicus*; flying squirrel, *Glaucomys sabrinus*; golden-mantled ground squirrel, *Callospermophilus saturatus*; chipmunks, *Eutamias*; cony or pika, *Ochotona princeps*; hoary marmot, *Marmota caligata* and *olympus*; all wild turtles not otherwise classified as endangered species, or designated as threatened species or sensitive species; mammals of the order *Cetacea*, including whales, porpoises, and mammals of the suborder *Pinnipedia* not otherwise classified as endangered species, or designated as threatened species or sensitive species. This section shall not apply to hair seals and sea lions which are threatening to damage or are damaging commercial fishing gear being utilized in a lawful manner or when said mammals are damaging or threatening to damage commercial fish being lawfully taken with commercial gear.

[Statutory Authority: RCW 77.12.020. 90-11-065 (Order 441), § 232-12-011, filed 5/15/90, effective 6/15/90. Statutory Authority: RCW 77.12.040. 89-11-061 (Order 392), § 232-12-011, filed 5/18/89; 82-19-026 (Order 192), § 232-12-011, filed 9/9/82; 81-22-002 (Order 174), § 232-12-011, filed 10/22/81; 81-12-029 (Order 165), § 232-12-011, filed 6/1/81.]

Reviser's note: RCW 34.05.395 requires the use of underlining and deletion marks to indicate amendments to existing rules, and deems ineffectual changes not filed by the agency in this manner. The bracketed material in the above section does not appear to conform to the statutory requirement.

WAC 232-12-014 Wildlife classified as endangered species. Endangered species include: Columbian white-tailed deer, *Odocoileus virginianus leucurus*; Mountain caribou, *Rangifer tarandus*; Blue whale, *Balaenoptera musculus*; Bowhead whale, *Balaena mysticetus*; Finback whale, *Balaenoptera physalus*; Gray whale, *Eschrichtius gibbosus*; Humpback whale, *Megaptera novaeangliae*; Right whale, *Balaena glacialis*; Sei whale, *Balaenoptera borealis*; Sperm whale, *Physeter catodon*; Wolf, *Canis lupus*; Peregrine falcon, *Falco peregrinus*; Aleutian Canada goose, *Branta canadensis luecopareia*; Brown pelican, *Pelecanus occidentalis*; Leatherback sea turtle, *Dermochelys coriacea*; Grizzly bear, *Ursus arctos horribilis*; Sea Otter, *Enhydra lutris*; White pelican, *Pelecanus erythrorhynchos*; Sandhill crane, *Grus canadensis*; Snowy plover, *Charadrius alexandrinus*; Upland sandpiper, *Bartramia longicauda*; Northern spotted owl, *Strix occidentalis*.

[Statutory Authority: RCW 77.12.020(6). 88-05-032 (Order 305), § 232-12-014, filed 2/12/88. Statutory Authority: RCW 77.12.040. 82-19-026 (Order 192), § 232-12-014, filed 9/9/82; 81-22-002 (Order 174), § 232-12-014, filed 10/22/81; 81-12-029 (Order 165), § 232-12-014, filed 6/1/81.]